# Arthropod Diversity and Abundance on a Suburban Remnant of the Shortgrass Steppe

Rocky Mountain High School biology students in collaboration with the staff, graduate students, and faculty associated with the Shortgrass Steppe Long Term Ecological Research Program

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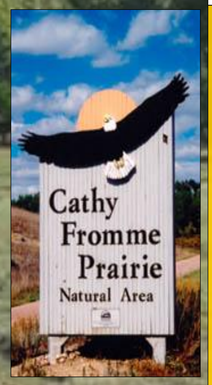
## Site Description




Cathy Fromme Prairie Natural Area is a 659 acre remnant of native shortgrass steppe managed by the City of Fort Collins. The site is bounded on the east, south, and north by suburban housing developments, open to the foothills on the west, has a bike path along the northern edge, and a raptor viewing area. The site contains low hills, three ephemeral tributaries to Fossil Creek, has no recorded history of tillage and remains home to 27 species of native and 4 species of non-native trees & shrubs; 54 species of native and 18 species of non-native grasses and grasslike plants; 145 species of native and 53 species of non-native wildflowers, vines, and other forbs; 103 species of birds including bald eagle, ferruginous hawk, and burrowing owl; 17 species of mammals including coyotes and black-tailed prairie dog (dominant to the site); 7 species of amphibians/reptiles including prairie rattlesnakes. A comprehensive list of flora and fauna is maintained by the City of Fort Collins Dept of Natural Resources.

The research site is located in the NE corner and contains an active prairie dog colony located between two small hills, adjacent to a bike path, with an ephemeral tributary of Fossil Creek at the base of the hills.

## Introduction

Arthropod censuses are recorded on the Shortgrass Steppe Long Term Ecological Research site and Pawnee National Grasslands as a part of long term ecological monitoring. As the front range becomes developed, remnants of the shortgrass steppe become surrounded by human habitation. Subsequently there are increased efforts to control "pest" insect species, an increase in water availability, changes in insect food sources, and changes in predator species. These environmental changes are likely to affect arthropod communities. Long term monitoring of arthropod communities on a remnant shortgrass steppe enclosed by development may provide baseline data useful for local agencies creating management plans for natural areas along the front range.

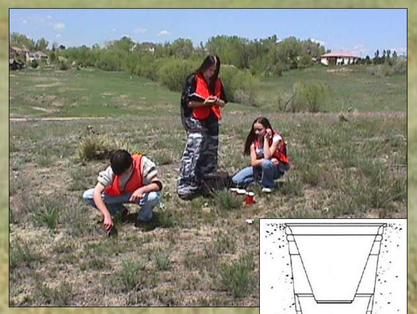
## Objectives

Track changes in relative abundance and species diversity of arthropods on the Cathy Fromme Prairie.

Conduct this research on different areas of the prairie (riparian area, ridgetop, prairie dog town, roadside) to see how arthropod communities are different in different microhabitats.

Conduct this research at different times of the year to track seasonal changes in arthropods.

## Research Methods



Prior to field work, students are trained at the schoolyard research plot at Rocky Mountain High School. They practice installing pitfall traps and learn how to identify arthropods.

Students in the field are accompanied by a teacher, graduate student, or volunteer from the Shortgrass Steppe Long Term Ecological Research program.

Pitfall traps are constructed from 16oz plastic cups, funnels and collecting cups.

In each location, 5 pitfall traps are dug into the ground, level with the surface, approx 1m apart on a straight line. GPS coordinates are recorded.

One week later, the traps are inventoried, removed, and the holes refilled.

Students conduct the pitfall trapping twice a year, in September (Fall) and May (Spring)

## Discussion

Beetles, ants, wasps, spiders, and isopods (pill-bugs) are the predominant species trapped, with isopods being highly variable with an abundance in wetter conditions. The data has not been correlated to weather conditions, or in the case of the riparian traps, to water flow in the ephemeral creek. The ridgetop is a dry, windy microhabitat and yet seems to hold a fair amount of arthropod diversity and abundance. A comparison with data from the SGS-LTER/PNG sites has not been done and no statistical analysis has been done on the data yet. As the amount of data increases, such analysis may show trends not seen here.

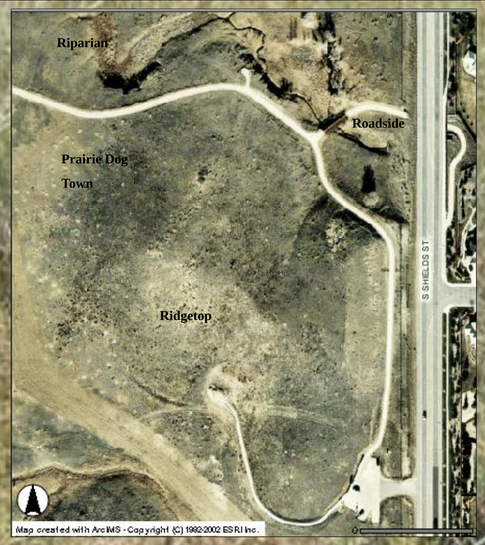
## Pitfall trap locations

"Ridgetop" is on top of a small hill between the prairie dog colony and Shields Ave

"Prairie Dog Town" is on the active colony at the base of the hill

"Roadside" is near the bike path at the base of the embankment for Shields Ave

"Riparian" is along the ephemeral creek due north of the prairie dog colony




## Preliminary Results